Humanities & Social Sciences Communications

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https://doi.org/10.1057/s41599-025-04556-x OPEN

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Not 'just' climate adaptation—towards *progressive* urban resilience

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Climate breakdown poses immense—potentially existential— threats to global economies, societies, and ecosystems. Mitigation must be pursued with vigour. However, given the consensus regarding the inevitability of climate change, and the doom-laden predictions of its impacts, adaptation is urgent. Yet progress remains slow, uncoordinated, and fraught with challenges. A particular issue is a lack of clarity—or inconsistency—regarding the framing of adaptation and resilience. In some contexts, interpretations of resilience are criticised for lacking ambition or for being regressive. In others, adaptation is critiqued for reinforcing inequity or for failing to contend with systemic drivers of risks. Such analyses can be deployed to illuminate how resilience and adaptation policy and practice might be catalysed in more sensitive and transformative ways. Learning from disparate evaluations of resilience and adaptation and reflecting on policy development in a large European city, the paper advocates for 'progressive resilience'. This interpretation aligns resilience (and adaptation) with socially, economically, and politically progressive agendas that are infused with a greater sense of spatial, temporal and social justice. Ultimately, the article articulates reference points for developing climate risk assessments and resilience plans and policies that offer 'more than just' adaptation, thereby supporting sustainable and inclusive socio-ecological interventions in an increasingly uncertain and dangerous world.

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Contemporary urban climate adaptation

Climate breakdown is a wicked issue *par excellence*. Complex and dynamic, climate change is imbued with uncertainty, comprises diverse stakeholder claims, and is resistant to resolution (Rising et al. 2022; Sobral et al. 2024). Urgent climate mitigation is vital to realise the aspirations of the Paris Agreement and to offer hope for global communities facing the most acute consequences of climate change. However, for many, climate breakdown is inevitable: impacts are 'locked in' even if the most ambitious mitigation targets are met.

'Adaptation'—adjustment to the actual or expected consequences of climate change—is now integral to global climate policy frameworks (IPCC, 2023). The 2015 Paris Climate Agreement established adaptation (and resilience) as a global imperative, with the UN co-ordinating a framework to meet the Global Goal of Adaptation. CoP 26 (November 2021) sought a 'step change' to ensure adaptation reaches parity with mitigation, with the Glasgow Climate Pact urging parties to integrate it into local, national, and regional planning (Article II: 8).

Cities worldwide are now, albeit incrementally, developing climate risk assessments and resilience and adaptation plans. International initiatives catalysing action include the UN's National Adaptation Planning Programme (CoP 16) and Race to Resilience, the Resilient City Catalyst, the Global Resilient Cities Network (GRCN) and Europe's Climate Adapt tool. Monitoring mechanisms have also been fostered, including the adaptation strand of the Carbon Disclosure Project city reporting, alongside benchmarking, such as the *Adaptation to climate change* international standard (ISO 14091: 2021).

These initiatives are laudable, pushing adaptation from the margins of climate policy, establishing reference points to assess risk, defining and prioritising goals and soliciting frameworks to monitor action. Yet progress remains frustratingly slow, hindered by a bewildering array of increasingly well-documented challenges (Owen, 2020; Kolte et al. 2023; Petzold et al. 2023). Consequently, many cities remain unprepared for climate impacts, contributing to what has been termed an 'adaptation gap' (UN Environment Programme, 2024). Even where adaptation and resilience plans exist, few define or characterise these two vital mobilising terms, rarely acknowledging tensions inherent within the concepts (Runhaar et al. 2017). Consequently, initiatives often lack a conceptual compass to underpin coherent, socially progressive adaptation strategies (White & O'Hare, 2014).

Reflecting on insights from the co-production of a municipal-level climate action plan, drawing upon recent conceptual and academic insights, and informed by workshops and qualitative interviews, the article forwards principles that propose a more *progressive* interpretation of adaptation and resilience (O'Hare, 2022). In so doing, it reclaims the concept of resilience to articulate a more socially cognisant, more integrated, and ultimately more ambitious understanding of climate adaptation and resilience.

Progressive resilience for ambitious climate adaptation

Reclaiming resilience and adaptation. 'Resilience' and 'adaptation' permeate policy and practice. Often used interchangeably, their articulation is subject to vibrant debate.

'Adaptation' is a relatively discrete term, often actor-centric, orientated toward building capacity to reduce the direct impacts derived from a changing climate. Its interpretation varies between being either reactive or anticipatory, or incremental or transformative (Wilson et al. 2020; IPCC, 2023). Incremental adaptation seeks adjustments whilst maintaining the essence of a system, whilst transformative adaptation brings more significant alterations to the socio-ecological dimensions of a system (Loginova & Batterbury, 2019). Table 1 notes indicative distinctions between these two types.

Resilience is a broader, systems orientated concept (Nelson et al. 2007), referring to how an entity withstands or absorbs impacts, and—under some interpretations—evolves to endure, and ideally thrive, amidst adversity.

From a policy and practice perspective, the concept of resilience has itself proved remarkably resilient. Reverberating across agendas, the term is notoriously imprecise, enabling its adoption, yet simultaneously disabling its utility. Conceptual understandings are usually tracked to the work of Holling (1973) who delineated two broad interpretations: 'engineering' and 'ecological' resilience. Engineering (single-state equilibrium) resilience refers to the ability of ecosystems to 'bounce-back' after disturbance, advocating a return to a pre-shock status by absorbing changes and persisting. In contrast, ecological resilience (multiple-state equilibrium) emphasises systemic change or adaptation to a new normality (Adger, 2000). This more evolutionary interpretation of resilience (Davoudi, 2012) emphasises reorganisation; 'bouncing-forward' by transforming to an inherently less vulnerable state (Shaw & Theobald, 2011; Matyas & Pelling, 2014).

Further distinctions have emerged between stability or change or between optimism and pessimism in systems (Leach et al. 2010; White & O'Hare, 2014). For instance, should a shock be conservatively withstood, or progressively adapted to? (Manyena et al. 2011; Shaw & Maythorne, 2012; O'Hare et al. 2015). Additionally, others have asked what in a system is worth preserving? Not all resilient phenomena—poverty or racism to take two examples—are desirable (Meerow et al. 2016; Ravetz, 2020).

The pervasiveness (Walker & Cooper, 2011) and malleability of the term resilience has drawn comparisons to sustainability (Guy & Marvin, 1999; Davidson et al. 2019), though not always favourably. Scholars critique its conceptual ambiguity (Klein et al. 2003; Gleeson, 2008; Davoudi et al. 2013), urging caution in its practical application (Porter & Davoudi, 2012). Echoing critiques of how climate policy is subject to 'discourses of delay' (Lamb et al. 2020), resilience is often seen as weaponised for political purposes (Brown, 2014) and appropriated by powerful actors to sustain the status quo (Cutter, 2016). Critics argue it is overly aligned with dominant neoliberal ontologies (McKinnon & Derickson, 2012; Joseph, 2013; Collier, 2014) emphasising individual responsibility and market-based solutions over systemic change. Some go further, advocating outright resistance, asserting that interventions under the guise of resilience often render people more—not less—vulnerable to threats (Neocleous, 2013).

Table 1 *Indicative* distinction between incremental and transformational adaptation.

Incremental adaptation	Transformational adaptation
- Responds to discrete, isolated hazards	- Risk considered in an anticipatory, holistic, integrated manner
- Reactively addresses impacts of disasters	- Proactively addresses root causes of vulnerability
- Risk management often individualised	- Socialised/ collective risk management
- Gradual change over short-term time horizons	- More profound change often over longer-term time horizons
- Develops *coping* strategies for maintaining system	- Catalyses system evolution/ resilience

Table 2 Dimensions of risk & adaptation through *progressive resilience*.

Dimensions of progressive resilience	Understanding risk	Framing adaptation
Reclaiming the concept of resilience	Prompts the consideration of risk in terms of systems. Recognises integration, comprehensiveness and connectivity across systems.	Interventions beyond reactively coping with the impacts of climate change (i.e. exceeds incremental adaptation). Understands shocks and threats as potential opportunities to 'bounce-forward'. Catalyse transformative adaptation through proactively addressing systemic vulnerability. Privileges sustainable and socially & environmentally sensitive responses to risk.
Risk literacy	Climate risk contextualised by a multitude of forces and factors across scales and sectors. 'Whole of system' analysis of totalities, networks and relationships, rather than isolated components.	Adapting to the complex, dynamic nature of interconnected systemic elements. Ensure adaptation interventions engage across boundaries, scales and sectors.
Addressing intersectionality	Assessments of the underlying, contextual dimensions of risk (climate disadvantage). Understand socio-economic, environmental, cultural and political drivers of risk beyond climate change.	Ensure interventions address underlying/ pre-existing conditions that create risk geographies. Take action that tackles wider drivers of vulnerability.
Uncertainty and dynamism	Recognises risk profile as non-static (dynamic). Risk alters across time according to changing/ evolving conditions and circumstances.	Long-term resilience to a multitude of overlapping and intersecting stresses *and* shocks. Recognise that resilience is iterative and responds to dynamic nature of risk.
Policy integration & co-benefits	Assumes comprehensive view of pervasive risk. Acknowledges broader drivers of underlying vulnerability & chronic stresses.	Climate adaptation converges with other progressive policies. Ensure wider policy and practice aligns with progressive climate resilience. Exploitation of co-benefits.
Collective action	Recognises risk pervades society, crossing sectors, stakeholders and administrative boundaries.	Resilience assumes a 'whole of society' posture. Responses socialised. Aspires to deliver benefits for wider society. Interventions to privilege those at greatest vulnerability/ with least adaptive capacity.

Articulations of climate adaptation must be orientated away from regressive 'static equilibrium' interpretations toward those that unleash the latent progressive features and attributes of resilience (Amin, 2013; Lager, 2023). This involves ensuring initiatives promote systemic reform and address inequality, rather than perpetuating already existing power dynamics or inequities.

The following sections outline a series of principles to guide the development of this more progressive type of urban resilience. Table 2 summarises the key dimensions.

Understanding systemic risk—transcending boundaries, scales and sectors. Coherent, anticipatory climate adaptation must be intelligence-led, informed by spatially cognisant (place sensitive), holistic climate risk assessments (IPCC, 2021). However, several research participants reported only a limited understanding of climate risk, with some acknowledging their absence altogether. A prime challenge lies in defining the parameters of risk assessments—a difficulty recognised in workshops and interviews by those responsible for assessing risk and evident in the limited analytical scope of existing assessments.

Assessing climate impacts is notoriously complex (Rus et al. 2018), with sensitivity and vulnerability varying significantly across spatial and sectoral geographies. Though relatively discrete administrative entities, cities are not autarkic. They possess complex socio-spatial connectivity, marked by porosity and rhizomatic networks. Cascading impacts, often temporally and geographically discontinuous, demand consideration of trans-boundary risk emanating from—and extending beyond—administrative jurisdictions. These risks include disruptions to extended supply chains, and the local consequences of regional and global population displacement and geopolitical instability (Desouza & Flanery, 2013).

Risk assessments frequently narrowly consider only climate-related drivers of risk. However, climate risk is deeply entwined with *other* risk drivers, not least those co-produced through urbanisation and urban development (Pelling, 2003). For instance, in the case study city, ageing and underfunded urban infrastructure—combined with pressures to allocate land for housing and infrastructure—was recognised by many as contributing to urban flood risk (O'Hare, 2021). Yet failing to fully comprehend non-climatic drivers when compiling risk assessments both circumscribes their lateral scope and forecloses the range of potential adaptive action.

Comprehensive climate impact assessments must, therefore, reveal the endogenous and exogenous systemic elements determining risk across scope and scale. The application of 'systems thinking', a concept permeating resilience discourse (Wright et al. 2012; Pisano, 2012), can facilitate navigation of the intricacies of risk, ensuring assessments are inclusive and comprehensive.

At its core, this approach is grounded in recognising the concatenation of interdependent, heterogeneous networks determining direct and indirect (cascading, sequential, and consequential) climate impacts on system materiality and functionality. Such 'whole-of-system' appraisals invite critical engagement with the world, analysing totalities and relationships rather than isolated components. Although understanding the interconnectivity of climate risk is vital, several research participants cautioned that a balance must be struck in determining a system's extent. Define too narrowly and analysis neglects 'real world' complexity. Yet conversely, an overly broad analysis can

induce analytical paralysis given the sheer density of relationships and feedback loops spanning geographies, sectors, and hierarchical scales that compose contemporary urban systems.

Addressing intersectionality—more than 'just' adaptation. There is 'no such thing' as a natural disaster (O'Keefe et al. 1976; Smith, 2006). Risk is socially constructed and unevenly distributed across interconnected and intersectional social, demographic and economic variables (Cutter et al. 2000). However, conventional distributional analyses often overlook these insidious contexts of risk, treating populations as homogeneous aggregations and neglecting the complex milieu of those deemed 'at risk' (O'Hare & White, 2017). Moreover, in what is termed the age of the polycrisis, climate change is a threat multiplier. It exacerbates existing societal and economic marginalisation, compounding inequalities and hindering the realisation of broader societal, environmental, and developmental aspirations (UN, 2023).

At its best, resilience thinking attends to the ecological *and* social dimensions of risk (Adger, 2006). Similarly, the concepts of vulnerability and disadvantage illuminate how environmental threats intersect with broader socio-economic contexts. Pre-existing conditions—described as the 'situational variability of social vulnerability drivers' (Rufat et al. 2015)—are chronic, accumulating over time and shaped by broader trends. These long-term stresses, and associated 'corrosive' disadvantages (Wolff & de-Shalit, 2007), create a pernicious backdrop of socio-economic precarity against which climate change unfolds, further intensifying the challenges of marginalised populations. For municipalities, the notion of 'place inequalities' offers a potentially useful framework for understanding how contextual vulnerabilities and disadvantages (Cutter et al. 2008), alongside the adaptive capacities of individuals, households, and communities, can be either extenuated or attenuated (Lindley et al. (2011).

The pursuit of progressive resilience demands differentiated responses to the pernicious and often deeply embedded vulnerabilities of certain populations or sectors (Rochdale Borough Council & National Flood Forum, 2024). It is only then that inclusive, socially just adaptation that aspires to ameliorate the structural forces driving systemic vulnerability can ever hope to be realised. This specific point is returned later.

Risk and resilience in a changing world—uncertainty & dynamism. Place-sensitive anticipatory resilience (Quay, 2010), necessitates identifying risks before they materialise and implementing proactive strategies to manage them. But this must be undertaken within emergent real-world assemblages.

Cities, like any complex system, are comprised of multiple interdependent components, evolving under ever-changing conditions. Interventions in one part of a system may produce unanticipated consequences elsewhere. Furthermore, understanding future climate vulnerability requires attention to longer temporalities. Some dimensions of vulnerability are relatively predictable. For example, communities with ageing populations or chronically underfunded infrastructure are likely to endure escalating risks over time as they become increasingly susceptible to climate change. However, such predictability is neither certain nor universal.

Compounding this challenge is a recognition that attempts to reveal systemic complexity are infused with uncertainty (Berkes, 2007) and blind spots: elements that are ignored, unseen, or undervalued. Even seemingly 'certain' aspects of risk at a given moment or within a specific geographical space can later fluctuate across spatial, social, and temporal axes. For instance, as a town planner acknowledged in a workshop, flood risk evolves and changes, making once seemingly 'certain' flood maps less reliable over time (see also Scott et al. 2013).

Such observations resonate with the concept of panarchy (Gunderson & Holling, 2002) emphasising the dynamic adaptive properties of complex systems spanning social, economic, and political spheres. However, traditional environmental management, often criticised for privileging 'command-and-control' risk management, can exacerbate structural vulnerabilities by ignoring the complexity of nonlinear realities.

A progressive approach to resilient risk assessment and management must instead recognise systems as dynamic entities over long time horizons. Consistent with evolutionary interpretations of resilience (Galderisi et al. 2020), this demands iterative risk assessments attuned to the dynamic impacts of climate change across systems. This must incorporate wide-angled considerations of interconnected, non-linear feedback loops, and recognition of the emergent properties that characterise unpredictability. It also requires responsive climate resilience plans that themselves are subject to continuous monitoring and—as necessary—revision.

The ultimate goal of progressive resilience in this context is to leave a legacy of climate resilience rather than vulnerability for subsequent generations. This requires the incubation of future-oriented approaches addressing both current and emerging risks and doing so across the multiple social, ecological, economic, and political dimensions outlined earlier. Vitally, it must also privilege spatial and intergenerational justice and take care to avoid unpalatable trade-offs, pathway dependency or maladaptation (Reckien et al. 2023; Coolsaet, 2025).

Exploiting co-benefits and policy integration. As noted, risk is conditioned by forces and circumstances that extend far beyond the immediate vicinity of a hazard. Meanwhile, the systemic, cascading impacts of climate change permeates society, worsening existing vulnerabilities and generating new ones. Efficacious responses must be equally expansive and attuned to the places, people, and organisations most at threat, not just from climate change but also from broader contextual risks.

Against this context, adaptation should serve as a catalyst for systemic action, fostering strategic alignment across scales and synchronising with progressive agendas across the spectrum of public and social welfare policy (Sayers et al. 2024). Practically, rather than functioning as a self-contained policy or programme, climate adaptation should infuse—and be infused by—efforts to address baseline vulnerabilities such as poverty and disempowerment. Examples might include engagement with broader agendas of inclusive growth and social justice to leverage synergies across public policy agendas. Interventions must also avoid redistributing or displacing risk to other sectors, groups, or timeframes. More proactively, adaptation may bring economic opportunities that must be shared across society, and ideally directed toward those most vulnerable to climate change.

With particular regard to this research, participants were keen that adaptation interventions intentionally harnessed co-benefits, or 'multiple resilience dividends' (see Table 3 for examples). They could, for instance, align with climate mitigation objectives (Howarth & Robinson, 2024), with broader disaster risk reduction agendas and complement if not even catalyse the mission of other progressive goals. Some participants admitted this was partly pragmatic, with some suggesting that reaping mutual benefits for biodiversity, improving health and equality, enhancing quality of life and catalysing equitable economic development improved the viability and social and political acceptance of adaptation initiatives.

Table 3 Indicative examples of multiple resilience dividends.

- Enhance societal physical and mental well-being by promoting recreation and active transport while also developing spaces that manage flood risk (e.g. multi-use flood basins).
- Promoting urban greening to reduce flood risk, provide cooling, improve air quality, and elevate public space quality.
- Leverage social and economic benefits from climate adaptation technologies and resilience practices.
- Support initiatives that deliver social value, especially for vulnerable communities facing climate or socio-economic challenges.
- Foster innovation and sustainable growth by helping SMEs engage in the climate adaptation economy.
- Bring broader environmental, biodiversity and public amenity benefits including creating better quality, ecologically vibrant and resilient green and blue space.

Ultimately, this demands careful cross-sectoral policy mapping and integration to marry the goal of reducing societal vulnerability to various shocks (including climate change) with efforts to deal with longer-term stresses and vulnerabilities. If successful, policy interventions should foster communities that are fairer, healthier, and better equipped to face future risks; in short, creating socio-ecological systems that are more resilient in the most ambitious sense of the term.

Collective action for progressive resilience. Given the ever-increasing impulse to understand the wickedness of systemic risk pervading intricate urban systems, the amelioration of climate impacts must assume a 'whole of society' approach (McClelland, 2022). Though refracted through local contexts, initiatives should avoid atomised, unconnected interventions that can so often privilege privatised parochial gains but neglect the broader drivers of risk. This necessitates the delivery of dividends that are more than (solely) self-protectionist and that are deliberative (Eriksen et al. 2024). In other words, progressive resilience should be networked, integrated and inclusive, sharing benefits as widely as possible.

From a practical perspective, 'solutions', in so far that they exist, must be co-produced through coalitions realised through cross-sectoral and cross-stakeholder collaboration. In practice, this requires sensitive engagement with endogenous social networks, recognising the complex diversity of (micro) communities and networks of civil society, faith-based and advocacy organisations. Again, this entails careful attention to the needs of those in society at greatest vulnerability to climate change and at greatest socio-economic marginality more generally. This principle lends greater coherence to resilience initiatives and, again pragmatically, has greater legitimacy, or what one research participant referred to as 'buy-in'.

Adaptation must also strive to deliver collective benefits at scale, across wider spatial areas or for 'neighbours' beyond the city's administrative geography. For instance, developments that are not themselves at significant climate risk should incorporate climate adaptation (rainwater harvesting or enhanced greening schemes) to lower the climate risk profile of the city and derive gains for local communities, neighbouring local authorities, and the wider region.

Conclusion

The concept of resilience is widely deployed as a rhetorical device across diverse contexts to frame responses to climate change and to address adaptation gaps. Yet the term is subject to interpretation and is deeply contingent on context (Connelly et al. 2020). Many participants in the research acknowledged this ambiguity, with some recognising how this characteristic can disable the concept's utility. Meanwhile, a burgeoning critical scholarship notes that, for many, the application of resilience and adaptation is considered as at best advocating for the preservation of the status quo, or at worst as alienating.

While remaining wary of the term, this article reappraises and reappropriates it, raising the aspirations of those pursuing resilience and bending its arc toward greater congruence with progressive social, economic and political agendas. Against this landscape, this article ultimately articulates reference points that might foster 'more than just' adaptation by those charged with the increasingly profound challenge of pursuing greater global climate resilience in uncertain times.

Data availability

In accordance with assurances given to research participants to protect their anonymity, the research data is not publicly available.

Received: 27 July 2024; Accepted: 10 February 2025;
Published online: 26 February 2025

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Acknowledgements

The research was funded by the UK's Natural Environment Research Council (NERC): award reference NE/V010174/1. With thanks to Paul Cobbing, Sally Randles and Steve Rice for comments on an earlier version of this paper.

Competing interests

The author declares no competing interests.

Ethical approval

Ethical approval for the study was provided by Manchester Metropolitan University Science and Engineering Research Ethics Committee on 2nd March 2021 (Review reference: 2021-28635-25370). Research was conducted in full accordance with the UKRI's ethical research guidance: www.ukri.org/manage-your-award/good-research-resource-hub/ethical-research-and-innovation.

Informed consent

Informed consent (a signed sheet and verbal confirmation) was gained from all participants involved in the study across the course of 2021-2022.

Additional information

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